

# A Comparative Analysis of the Determinants of Executive Compensation between Canadian and U.S. Firms

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Volume 50, numéro 2, 1995

URI : <https://id.erudit.org/iderudit/051013ar>

DOI : <https://doi.org/10.7202/051013ar>

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Éditeur(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (imprimé)

1703-8138 (numérique)

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Citer cet article

Magnan, M. L., St-Onge, S. & Thorne, L. (1995). A Comparative Analysis of the Determinants of Executive Compensation between Canadian and U.S. Firms. *Relations industrielles / Industrial Relations*, 50(2), 297–319.  
<https://doi.org/10.7202/051013ar>

## Résumé de l'article

Partout en Amérique du Nord, la rémunération des dirigeants de sociétés ouvertes fait de plus en plus l'objet d'un examen minutieux. Cette préoccupation se reflète dans la presse populaire (Globe and Mail, 10 avril 1993 ; Time, 9 janvier 1992) et dans les multiples revues de littérature sur la rémunération des dirigeants (Gomez-Mejia et Welbourne 1989 ; Lambert et Larcker 1991 ; Milkovich et Rabin 1991). Toutefois, la quasi-totalité de la recherche a été réalisée dans un contexte américain. En effet, alors qu'aux États-Unis la Securities and Exchange Commission (SEC) exige que les sociétés ouvertes divulguent la rémunération de leurs cinq dirigeants les mieux payés, les réglementations canadiennes n'obligeaient jusqu'à récemment les sociétés ouvertes à ne divulguer que la somme reçue par leurs dirigeants en tant que groupe.

La présente étude vise à combler partiellement ce vide en utilisant les seules données fiables sur la rémunération des dirigeants canadiens, lesquelles sont publiées par des sociétés dont le siège social est au Canada et dont les actions sont négociées sur un marché boursier américain. Ces sociétés sont sujettes à la réglementation américaine de divulgation de la rémunération des dirigeants. La rémunération des dirigeants de ces sociétés canadiennes est d'abord analysée quant à l'étendue des quatre liens suivants (1) la relation entre la taille de l'organisation et la rémunération des dirigeants, (2) celui entre la performance organisationnelle et la rémunération des dirigeants, (3) l'effet direct du contrôle financier de la firme sur la rémunération des dirigeants et, (4) l'effet modérateur du contrôle financier d'une firme sur la relation entre la performance organisationnelle et la rémunération des dirigeants. Par la suite, la rémunération des dirigeants de ces sociétés canadiennes est comparée à celle des dirigeants de sociétés américaines similaires (taille, secteur) quant à l'étendue des quatre liens susmentionnés. L'ampleur des liens est inférée des coefficients obtenus d'analyses de régressions des moindres carrés.

Les résultats obtenus indiquent que la taille d'une organisation est reliée positivement à la rémunération des dirigeants des sociétés canadiennes, et de façon plus étroite que pour les dirigeants de sociétés américaines. Les résultats sont cohérents avec ceux obtenus par les études antérieures tant britanniques qu'américaines. Les résultats de l'étude indiquent également que la performance organisationnelle, mesurée par le rendement de l'actif des actionnaires, influence positivement la rémunération des dirigeants de sociétés canadiennes. Cette relation est toutefois plus forte dans le cas des dirigeants de sociétés américaines. Il ressort également de l'étude que la présence d'actionnaires importants dans une société (contrôle restreint) réduit le niveau de rémunération de ses dirigeants comparativement aux sociétés sans bloc de contrôle (propriété dispersée). Cet effet est plus marqué pour les sociétés américaines.

La relation entre la performance organisationnelle et la rémunération des dirigeants de sociétés canadiennes et américaines est toutefois modifiée par l'introduction du contrôle financier comme variable modératrice. En effet, la performance organisationnelle — estimée à partir d'un indice de marché — a un effet positif sur la rémunération des dirigeants de sociétés canadiennes à propriété dispersée mais non sur la rémunération des dirigeants de sociétés canadiennes à contrôle restreint. Par contre, pour les dirigeants de sociétés américaines, la relation entre la performance organisationnelle — estimée par un indice de marché — et la rémunération des dirigeants est positive uniquement pour les sociétés à contrôle restreint mais non pour les sociétés à propriété dispersée. Les résultats obtenus pour les firmes américaines, mais non pour les firmes canadiennes, sont cohérents avec l'interprétation de la théorie des agences proposée par Tosi et Gomez-Mejia (1989). Selon ces auteurs, l'existence d'un bloc de contrôle dans l'actionnariat d'une firme devrait amener l'établissement d'un lien plus étroit entre la performance organisationnelle et la rémunération des dirigeants car les actionnaires ont la capacité d'imposer une formule de rémunération contingente à la performance.

# ***A Comparative Analysis of the Determinants of Executive Compensation between Canadian and U.S. Firms***

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*This study attempts to identify determinants of executive compensation in Canada while comparing how they differ between Canada and the United States. Results suggest that firm size, firm performance, and firm ownership structure all determine executive compensation in Canada. However, several differences between the determinants of executive compensation in Canada and the U.S. are identified.*

Research on executive compensation is of growing interest to both academics and practitioners. On a theoretical level, understanding how executive compensation policies influence managerial behaviour is critical to the development of a viable theory of the firm (Baker et al. 1988). The determinants of the magnitude and type of executive compensation are also of increasing practical concern to stockholders, regulatory agencies and other stakeholders. This growing interest is well-documented in recent articles in the U.S. academic literature and in the popular press (e.g.,

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  - The authors thank McGill University, the Canadian Academic Accounting Association Research Committee and the Canadian Institute of Chartered Accountants for their financial support. Susan Bartholomew's research assistance is also acknowledged. Helpful comments and suggestions were received from the reviewers, from David Balkin and from conference participants at the Canadian Academic Accounting Association, the Administrative Sciences Association of Canada and at the Association française de gestion des ressources humaines annual conferences.

Gomez-Mejia and Welbourne 1989; Lambert and Larcker 1991; Milkovich and Rabin 1991; *Time*, January 9, 1992; *The Globe & Mail*, April 10, 1993). However, our understanding of executive compensation practices for constituencies outside the United States is limited. To the best of our knowledge, only Kostiuk (1989) has formally investigated the association between firm size and executive compensation in non-U.S. firms, in this case in a sample of British firms.

Academic research which examines the executive compensation practices among Canadian firms appears to be non-existent since Canadian securities regulations have traditionally required only *group* disclosure of compensation data for individuals who are defined as executives. In contrast, the U.S. Securities and Exchange Commission (SEC) has required publicly-owned corporations to publish *individual* compensation data for the five highest paid executives. Historically, evidence on Canadian executive compensation practices has been limited to the subset of Canadian firms that are publicly traded in the United States (interlisted firms).<sup>1</sup>

The objective of the present study is to increase our knowledge of executive compensation practices through a comparative analysis of specific determinants of Canadian and U.S. executive compensation: firm size, firm performance and ownership structure. These determinants have been identified as significant influences on executive compensation practices in prior empirical research.

This study makes several key contributions. To our knowledge, it is the first attempt to test systematically the determinants of executive compensation in Canadian firms. Prior studies on this theme are primarily descriptive, consisting largely of consultants' surveys which rely on self-reported data by executives. The results of this study allow the relevance of U.S.-based research evidence to be assessed in a Canadian context. In addition, this study provides justification for future research on the cultural and institutional differences that influence the determinants of executive compensation in each country.

## ***RESEARCH HYPOTHESES***

### ***The Association between Firm Size and Executive Compensation***

Strong empirical evidence supports the existence of a positive association between firm size and level of executive compensation (see Baker et

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1. Since October 1993, all firms regulated by the Ontario Securities Commission must disclose executive compensation according to a format similar to new U.S. SEC requirements that took effect in 1992. In future years, considerably more data will thus be available.

al. 1988, for a review). This association has been substantiated across industries, and for both U.S. and British firms, with the log of size typically explaining between .25 and .30 of the log of CEO compensation (Fox 1985; Kostiuk 1989).

The positive association found between firm size and executive compensation may be explained by both the internal organization of a firm and by the external labour market. The internal organization argument is based upon the finding that large firms are likely to have more hierarchical levels than small firms (Child 1973). According to this argument, higher compensation levels for executives of larger firms are necessary to ensure that there are adequate compensation differentials between hierarchical levels throughout the firm (Gomez-Mejia et al. 1987; Simon 1957). In addition, it is suggested that since executives who manage larger and more complex firms require greater knowledge and ability than do executives of smaller and less complex firms, they command a higher level of compensation on the external labour market (Becker 1964; Rosen 1982). Since both arguments supporting the influence of firm size on executive compensation would apply to both U.S. and Canadian firms, it is anticipated that the positive association found between firm size and level of executive compensation in U.S. firms should also be found in Canadian firms. As well, the magnitude of the association is expected to be similar for both countries.

Hypothesis 1a:

There is a positive association between firm size and executive compensation in Canadian firms.

Hypothesis 1b:

The level of the association between firm size and executive compensation is similar for Canadian and U.S. firms.

### ***The Association between Firm Performance and Executive Compensation***

Compensation plans are used to motivate and reward performance. This is particularly important at the executive level where due to the complex nature of the executive function, assessment of executive performance is difficult. Many executive compensation plans use firm performance as a surrogate measure for executive performance. It is presumed that compensating a firm's executives based upon firm performance may encourage executives to perform in ways that will maximize the wealth of stockholders (Banker et al. 1988; Holmstrom 1979; Jensen and Meckling 1976; Fama and Jensen 1983). This belief is shared by practitioners and researchers alike (Crystal 1991).

The U.S.-based empirical evidence of the strength of the association between corporate performance and executive compensation is mixed depending upon the measures used. However, the U.S. evidence generally shows that a positive association exists between executive compensation and corporate performance as measured by either market- or accounting-based measures, with corporate performance typically explaining around 10% of interfirm differences in executive compensation (recent studies include Antle and Smith 1986; Lambert and Larcker 1987; Leonard 1990; Murphy 1985; Sloan 1993; Tosi and Gomez-Mejia 1989). It is anticipated that this positive association will also exist in Canadian firms.

Hypothesis 2a:

There is a positive association between firm performance and level of executive compensation in Canadian firms.

However, the results of consultants' surveys suggest that compensation received by executives of U.S. firms is typically more responsive to corporate performance than the compensation received by executives of Canadian firms (*Business Week*, January 8, 1990; *Financial Times of Canada*, July 24, 1993; *The Financial Post*, November 20, 1989). Based upon these survey results, it is expected that the association between firm performance and executive compensation is stronger for U.S. executives than for Canadian executives.

Hypothesis 2b:

The association between firm performance and level of executive compensation is stronger in U.S. firms than in Canadian firms.

### ***The Association between Ownership Structure and Executive Compensation***

Typically, firms are considered to be controlled by their owners. However, a separation of ownership and control in a firm can occur when there is such a large number of shareholders that the owners' power is diluted (Berle and Means 1932).

Within a *widely-held* firm, diffuse share ownership reduces the incentive of any single stockholder to closely monitor executive actions and decisions in order to ensure that they are in the stockholders' best interests (Demsetz and Lehn 1985; Jensen and Meckling 1976; Tosi and Gomez-Mejia 1989). Without this challenge to the executives' authority, control of the firm is effectively held by the firm's executives. In contrast, in a *closely-held* firm, a single stockholder interest exists that is large enough to warrant expending resources to monitor executives. The type of firm ownership structure, denoted by widely-held or closely-held, thus indicates whether firms are controlled by executives or shareholders (McEachern 1975).

Empirical evidence indicates that executives will pursue their own personal interests at the expense of the shareholders' interests whenever possible (Smith 1990). Thus, it appears reasonable to expect that in the absence of monitoring, executives will pay themselves more than if they were being effectively monitored (Allen 1981; Arnould 1985). This suggests that the level of executive compensation is expected to be lower in closely-held firms than in widely-held firms. This association is expected to be similar for both Canadian and U.S. firms.

Hypothesis 3a:

The level of executive compensation is lower in Canadian closely-held firms than in Canadian widely-held firms.

Hypothesis 3b:

The association between firm ownership structure and executive compensation is similar for Canadian and U.S. firms.

### ***The Moderating Impact of Firm Ownership Structure on the Association between Firm Performance and Executive Compensation***

One of the purposes of performance-contingent compensation schemes is to increase the incentive for participants to behave in a specified way. Performance-contingent compensation can be used to align the interests of executives with those of shareholders, so that actions which maximize the wealth of executives will also maximize shareholders' wealth (e.g., Jensen and Meckling 1976). Agency theory assumes that executives are risk averse; therefore, executives dislike performance-contingent pay schemes due to the uncertainty it imposes upon them. When executives have the discretion to do so (i.e., in widely-held firms), they will typically avoid adopting performance-contingent compensation since such schemes increase their exposure to personal risk. Gomez-Mejia et al. (1987) support this proposition by suggesting that closely-held firms are more likely to impose performance-contingent compensation upon their executives than widely-held firms. Thus, it appears reasonable to expect that the association between firm performance and executive compensation is weaker in widely-held firms than in closely-held firms.

Empirical evidence of the moderating influence of the firm's ownership structure has already been observed in a U.S. context by Gomez-Mejia et al. (1989). Their results indicate that firm performance explains seven times the amount of variance in executive compensation in closely-held firms than in widely-held firms. Similar results are expected for executive compensation in Canadian firms.

Hypothesis 4a:

The association between firm performance and executive compensation is stronger in Canadian closely-held firms than in Canadian widely-held firms.

**Hypothesis 4b:**

The moderating effect of ownership structure on the association between firm performance and executive compensation is similar for Canadian and U.S. firms.

***METHOD******Sample***

In Canada, reliable data about executive compensation has historically been available only from proxy statements of Canadian firms that are publicly traded on U.S. stock exchanges, otherwise known as *interlisted firms*. Compensation and financial measurements of 72 interlisted Canadian firms was gathered from their proxy statements and annual reports for the 1984-1990 period. Firms which did not disclose the required compensation information in their proxy statements were eliminated from the sample. The final Canadian sample included 38 firms.\*

In order to minimize biases arising from industry differences, U.S. firms of comparable size and in the same industrial groups were selected to form the study's U.S. sample. Corresponding research data was then obtained for the U.S. sample, which is comprised of 32 U.S. firms. In total, 352 firm-year observations have been obtained.

***Measures***

The present study focuses on the compensation received by Chief Executive Officers (CEOs) since they are clearly responsible for firm performance. The measure of CEO COMPENSATION used in this study is *cash compensation*. Cash compensation is defined as the sum of salary payments and bonus awards received in a given year, log transformed to allay potential econometric problems such as heteroscedasticity. While a focus on the "incentive pay-performance" association would be interesting, current disclosure practices do not allow such investigations. Only 25% of Canadian firms in the sample and 33% of U.S. firms disclosed short-term bonuses separately during the period covered by the study. Such inconsistent disclosure practices preclude any reliable statistical analysis. With respect to bonuses from long-term incentive plans, no Canadian firm indicated their existence during the 1984-1990 period. A sizable number of U.S. firms declared that they had long-term incentive plans: 30% of sample firms in 1990 and an average of 14% during 1984-1989. Overall, however,

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\* A list presenting the sample Canadian firms with matched U.S. firms is available upon request from the authors.

only 5% paid out identifiable amounts to CEOs. Again, too few observations are available to make any reliable inferences. Finally, several firms, did not disclose stock option plan characteristics such as vesting conditions and expiration terms that are necessary for a reliable valuation.

Recent empirical work still relies on cash compensation and, in fact, advises against including the value of stock options or other long-term market-based incentive plans when studying executive compensation (see, for example, Lambert and Larcker 1987; Janakiraman et al. 1992; Sloan 1993). Stock option valuation is subject to substantial measurement error since most option valuation models rely on assumptions that are not applicable to executive stock options (Antle and Smith 1986; Lambert et al. 1991). Such measurement errors introduce noise in the data and lower the explanatory power of regression models even if they are valid. All these considerations bring us to focus initially on a measure of executive compensation, cash salary+bonus, that is reliable and comparable across countries. Prior research on intercountry comparisons has also relied on cash compensation (e.g., Kostiuk 1989).

Firm SIZE is measured using log (Sales) as disclosed in the firm's annual financial statements. A logarithmic transformation enhances the regression model's statistical fit and is consistent with recent research that finds the association between firm size and executive compensation to be best specified in a natural logarithmic form (Baker et al. 1988).

Since the study focuses on cash compensation received by executives in a given year, a firm's PERFORMANCE is measured by relying on two current indicators: *stock market return* (RETURN) and *return on equity* (ROE). Short-term bonus plan descriptions suggest that current performance is a prime determinant of executive cash compensation. Moreover, the autocorrelation of accounting indicators could introduce econometrical problems into the analysis.

A firm's RETURN is computed in the following way:

$$\frac{\text{Stock price}_t - \text{Stock price}_{t-1} + \text{Dividend}_t}{\text{Stock price}_{t-1}}$$

where (t) is the current year closing stock price and (t-1) is the previous year closing stock price. A firm's ROE is computed in the following way:

$$\frac{\text{Net Income}_t}{\text{Stockholders' Equity}_t}$$



The country effect is captured by the indicator variable COUNTRY that takes the value of (1) for U.S.-based firms or (0) for Canadian-based firms. A firm's country is defined by its incorporation statutes and by the location of its head office. Interaction variables (see Kmenta 1986: 508-510) are used to indicate the extent to which U.S. firms differ from Canadian firms in their association between firm characteristics (either size, performance or ownership structure) and CEO compensation.

The effect of firm ownership structure is captured by the indicator variable denoted as STRUCTURE that takes the value of (1) for closely-held firms or (0) for widely-held firms. A firm is defined as closely-held when a stockholder or a group of related stockholders owns more than 20 percent of a firm's voting stock. Otherwise, the firm is considered to be widely-held.

### *Statistical Analysis*

The present study's statistical analysis relies upon an econometric estimation of the association between CEO compensation (the dependent variable) and firm size, firm performance and firm ownership structure (the independent variables). In order to capture omitted factors that may lead to a difference in CEO compensation levels between firms from both countries, the indicator variable (as denoted by COUNTRY) is also included as a separate independent control. A pooled multiple regression design that regroups all time-series and cross-sectional observations into a single data matrix is used (Kmenta 1986). To control for a potential fixed time effect, year-specific indicator variables are also incorporated into regression equations. Hypotheses 1a and 1b are tested through the following regression equation, with  $i$  identifying the firm,  $t$  the year and  $B_0$  the intercept (for ease of exposition, fixed time effect variables are not presented):

$$(1) \text{ CEO Compensation}_{i,t} = B_0 + B_1 \text{COUNTRY}_{i,t} + B_2 \text{SIZE}_{i,t} + B_3 \text{SIZE}_{i,t} * \text{COUNTRY}_{i,t} + e_{i,t}$$

Hypotheses 2a and 2b are tested through the following regression equation:

$$(2) \text{ CEO Compensation}_{i,t} = B_0 + B_1 \text{COUNTRY}_{i,t} + B_2 \text{RETURN}_{i,t} + B_3 \text{RETURN}_{i,t} * \text{COUNTRY}_{i,t} + B_4 \text{ROE}_{i,t} + B_5 \text{ROE}_{i,t} * \text{COUNTRY}_{i,t} + e_{i,t}$$

Hypotheses 3a, 3b, 4a and 4b are tested through the following regression equation:

$$(3) \text{ CEO Compensation}_{i,t} = B_0 + B_1 \text{COUNTRY}_{i,t} + B_2 \text{STRUCTURE}_{i,t} + B_3 \text{COUNTRY}_{i,t} * \text{STRUCTURE}_{i,t} + B_4 \text{RETURN}_{i,t} + B_5 \text{RETURN}_{i,t} * \text{COUNTRY}_{i,t} + B_6 \text{RETURN}_{i,t} * \text{STRUCTURE}_{i,t} + B_7 \text{RETURN}_{i,t} * \text{COUNTRY}_{i,t} * \text{STRUCTURE}_{i,t} + B_8 \text{ROE}_{i,t} + B_9 \text{ROE}_{i,t} * \text{COUNTRY}_{i,t} + B_{10} \text{ROE}_{i,t} * \text{STRUCTURE}_{i,t} + B_{11} \text{ROE}_{i,t} * \text{COUNTRY}_{i,t} * \text{STRUCTURE}_{i,t} + e_{i,t}$$

Interaction terms are used to indicate the extent to which closely-held firms, either U.S. or Canadian, differ from widely-held firms in their association between firm performance and CEO compensation. These different types of firms account for all possible combinations of country and ownership structure: closely-held Canadian firms, widely-held Canadian firms, closely-held U.S. firms and widely-held U.S. firms.

Coefficients  $B_4(B_8)$  through  $B_7(B_{11})$  are used to examine how the association between RETURN(ROE) and CEO compensation differs between different types of firms. Coefficient  $B_4(B_8)$  in equation 3 measures the association between RETURN(ROE) and CEO compensation for widely-held Canadian firms. Coefficient  $B_5(B_9)$  indicates how the association between RETURN(ROE) and CEO compensation in widely-held U.S. firms differs from the association between RETURN(ROE) and compensation found in widely-held Canadian firms. The sum of coefficients  $B_4(B_8)$  and  $B_5(B_9)$  identifies the association between RETURN(ROE) and compensation for widely-held U.S. firms. Coefficient  $B_6(B_{10})$  indicates how closely-held Canadian firms differ from widely-held Canadian firms in their association between RETURN(ROE) and CEO compensation. The sum of  $B_4(B_8)$  and  $B_6(B_{10})$  shows the extent of the association between RETURN(ROE) and compensation for closely-held Canadian firms. Finally, coefficient  $B_7(B_{11})$  indicates how closely-held U.S. firms differ from closely-held Canadian firms in their relation between RETURN(ROE) and compensation. The sum of  $B_4(B_8)$ ,  $B_6(B_{10})$  and  $B_7(B_{11})$  provides the relation between RETURN(ROE) and CEO compensation in closely-held U.S. firms.

## ***RESULTS***

### ***Descriptive Statistics***

Descriptive statistics about the firms in our sample are provided in Table 1. Panel A shows that during the 1984-1990 period, U.S. firms experienced more rapid growth in their stock prices than Canadian firms. Annual stock returns averaged 13.6% for U.S. firms but only 2.0% for Canadian firms. This firm performance differential is consistent with patterns shown by benchmark indices from the two countries for this period (Standard & Poor's in the U.S., TSE 300 in Canada).

Panel B of Table 1 suggests that the average CEO compensation level is higher in U.S. firms than in Canadian firms ( $p \leq 0.013$ ). This result confirms consultants' findings indicating that the average compensation of U.S. CEOs is the highest worldwide (e.g., *Towers Perrin International Survey* 1991).

TABLE 1  
Descriptive Statistics on Sample Firms  
Panel A: Firm Characteristics (Annual average for the 1984-1990 period)

	<i>U.S. Firms</i>	<i>Canadian Firms</i>
Stockholders Equity (Cdn\$ 000,000)	1,876	1,537
Stock Market Returns (%)	13.6	2.0
Return on Equity (%)	11.1	9.3

Panel B: CEO Cash Compensation

	<i>1990</i>		<i>Average 1984-1989</i>	
	<i>U.S. firms</i>	<i>Canadian firms</i>	<i>U.S. firms</i>	<i>Canadian firms</i>
Salary+Bonus (Cdn \$ 000)	849	639	617	540

### *The Association between Firm Size and Executive Compensation*

Table 2 indicates that differences in firm size explain 54.5% of total variance in CEO compensation ( $F = 47.7$ ,  $p \leq .001$ ). Hypothesis 1a, which states that there is a positive association between firm size and executive compensation in Canadian firms, is supported with the coefficient for SIZE being positive (0.28) and significant ( $p \leq .001$ ).

TABLE 2  
Pooled Regression Analysis of the Relationship between Firm Performance Measures and CEO Compensation<sup>1</sup> over the 1984-1990 Period, Moderating for a Firm's Country (U.S. vs Canada)

<i>Explanatory Variable</i>	<i>Predicted Sign</i>	<i>Coefficient</i>	<i>p-value</i> <sup>2</sup>
Intercept + Fixed Time Effects <sup>3</sup>			
COUNTRY <sup>4</sup>	+	0.93	.013
SIZE <sup>5</sup>	+	0.28	.001
SIZE*COUNTRY <sup>6</sup>	=0	-0.05	.087
Adjusted R <sup>2</sup>	54.5%		
F (p-value)	47.7 (.001)		
n	352		

1. Natural log of salary plus bonus.

2. One-tailed t-tests if prediction, two-tailed otherwise.

3. The intercept and coefficients for dummy variables that capture year-specific time effects are not presented.

4. Dummy variable for country of origin: 1 if United States, 0 if Canada.

5. Natural log of sales.

6. Interaction term to denote how U.S. firms differ from Canadian firms in the relationship between firm size and CEO compensation.

Hypothesis 1b which states that the association between firm size and CEO compensation is similar for U.S. and Canadian firms, is not supported. U.S. firms appear to less closely align their CEOs' compensation with firm size than do Canadian firms, with the coefficient for the interaction term (as denoted by SIZE\*COUNTRY) being negative ( $-0.05$ ) and significant ( $p \leq .087$ ). These findings suggest that while an increase of 10% in firm size brings an increase of 2.8% in compensation for CEOs of Canadian firms, the increase in U.S. executive compensation is only 2.3%.

### ***The Association between Firm Performance and Executive Compensation***

Table 3 captures the extent of the association between firm performance measures and executive compensation, taking into account a firm's country. The regression has an adjusted  $R^2$  of 11.2% ( $p \leq .001$ ). Hypothesis 2a, which asserts that firm performance is positively related to executive compensation in Canadian firms, does not appear to be supported. While there is a positive association between stock market return and CEO compensation for Canadian firms, it is not statistically significant at conventional levels.

TABLE 3

**Pooled Regression Analysis of the Relationship between Firm Performance Measures and CEO Compensation<sup>1</sup> over the 1984-1990 Period, Moderating for a Firm's Country (U.S. vs Canada) and Ownership Control**

<i>Explanatory Variable</i>	<i>Predicted Sign</i>	<i>Coefficient</i>	<i>p-value</i> <sup>2</sup>
Intercept + Fixed Time Effects <sup>3</sup>			
COUNTRY <sup>4</sup>	+	0.25	.001
ROE <sup>5</sup>	+	0.17	.120
ROE*COUNTRY <sup>6</sup>	+	0.57	.060
RETURN <sup>7</sup>	+	0.11	.217
RETURN*COUNTRY <sup>6</sup>	+	-0.13	.256
Adjusted R <sup>2</sup>	11.2%		
F (p-value)	4.9 (.001)		
n	343		

1. Natural log of salary plus bonus.

2. One-tailed t-tests if prediction, two-tailed otherwise.

3. The intercept and coefficients for dummy variables that capture year-specific fixed time effects are not presented.

4. Dummy variable for country of origin: 1 if United States, 0 if Canada.

5. Return on equity.

6. Interaction term to denote how U.S. firms differ from Canadian firms in the relationship between firm performance and CEO compensation.

7. Annual stock return.

Results show that hypothesis 2b, which asserts that the association between firm performance and CEO compensation is stronger for U.S. firms than for Canadian firms, holds for firm performance as measured by return on equity but not as measured by stock market performance. The association between return on equity and CEO compensation is found to be stronger for U.S. firms with the interaction term coefficient being positive (0.57) and statistically significant ( $p \leq .060$ ). However, consistent with prior research findings (Lambert and Larcker 1987), our findings appear to indicate that stock market returns do not seem to affect CEO compensation in U.S. firms.

### ***The Direct and Moderating Influences of Firm Ownership Structure on Executive Compensation***

Table 4 illustrates the association between firm performance and CEO compensation, with the firm ownership structure used both as a control (hypotheses 3a and 3b) and as a moderating variable (hypotheses 4a and 4b). Incremental F tests indicate that the addition of ownership structure as both a main effect and as a moderating variable significantly improves the fit of the regression model.

When ownership structure is included in the analysis, there is no evidence of an association between return on equity and executive compensation in either country for widely-held or closely-held firms. This result is not entirely unexpected given the mixed nature of the existing empirical evidence relying upon accounting-based measures of performance (for example see Antle and Smith 1986; Lambert and Larcker 1987; Clinch 1991). Additional research is needed to specifically investigate the implications of this finding.

Results shown on Table 4 support hypothesis 3a which posits that the level of executive compensation is lower in Canadian closely-held firms than in Canadian widely-held firms (STRUCTURE coefficient =  $-0.19$ ;  $p \leq .015$ ). Hypothesis 3b is not supported. Hypothesis 3b anticipates no difference between countries in the level of executive compensation after controlling for firm ownership structure and country. Regression results suggest, however, that the influence of ownership structure on the level of CEO compensation is *greater* in U.S. firms than in Canadian firms, with the interaction term coefficient (as indicated by COUNTRY\*STRUCTURE) being significantly negative ( $-0.26$ ;  $p \leq .067$ ).

Hypothesis 4a, which posits a stronger association between firm performance and CEO compensation for closely-held Canadian firms than widely-held Canadian firms, is not supported. Contrary to expectations, the strength of the association between stock market returns and CEO

compensation for closely-held Canadian firms is weaker than for widely-held Canadian firms as evidenced by the negative interaction term coefficient (as indicated by  $\text{RETURN} \times \text{STRUCTURE} = -1.00$ ;  $p \leq .001$ ).

TABLE 4  
Pooled Regression Analysis of the Relationship between Firm Performance Measures and CEO Compensation<sup>1</sup> over the 1984-1990 Period, Moderating for a Firm's Country (US vs Canada) and Ownership Control

<i>Explanatory Variable</i>	<i>Predicted Sign</i>	<i>Coefficient</i>	<i>p-value</i> <sup>2</sup>
Intercept + Fixed Time Effects <sup>3</sup>	?		
COUNTRY <sup>4</sup>	+	0.33	.003
STRUCTURE <sup>5</sup>	-	-0.19	.015
COUNTRY*STRUCTURE <sup>6</sup>	=0	-0.26	.067
RETURN <sup>7</sup>	+	0.90	.001
RETURN*COUNTRY <sup>8</sup>	+	-0.85	.007
RETURN*STRUCTURE <sup>9</sup>	+	-1.00	.001
RETURN*STRUCTURE*COUNTRY <sup>10</sup>	=0	1.03	.017
ROE <sup>11</sup>	+	0.01	.535
ROE*COUNTRY <sup>8</sup>	+	0.11	.419
ROE*STRUCTURE <sup>9</sup>	+	0.12	.376
ROE*STRUCTURE*COUNTRY <sup>10</sup>	=0	0.24	.754
Adjusted R <sup>2</sup>	19.1%		
F (p-value)	5.7 (.001)		
n	343		

1. Natural log of salary plus bonus.
2. One-tailed t-tests if prediction, two-tailed otherwise.
3. The intercept and coefficients for dummy variables that capture year-specific fixed time effects are not presented.
4. Dummy variable for country of origin: 1 if United States, 0 if Canada.
5. Dummy variable for ownership control: 1 if closely-held, 0 for widely-held.
6. Interaction term to denote how compensation differs between U.S. and Canadian closely-held firms.
7. Annual stock return.
8. Interaction term to denote how U.S. widely-held firms differ from Canadian widely-held firms in the relationship between firm performance and CEO compensation.
9. Interaction term to denote how Canadian closely-held firms differ from Canadian widely-held firms in the relationship between firm performance and CEO compensation.
10. Interaction term to denote how U.S. closely-held firms differ from Canadian closely-held firms in the relationship between firm performance and CEO compensation.
11. Return on equity.

Hypothesis 4b which posits the effect of firm structure on the association between firm performance and executive compensation to be similar for both countries, is not supported. As indicated in Table 4, COUNTRY appears to moderate the influence of ownership structure on the association between firm performance and CEO compensation. On the one hand, results indicate that the association between firm performance as measured by stock market returns is much stronger in closely-held U.S. firms than in closely-held Canadian firms, with the interaction term coefficient (RETURN\*COUNTRY\*STRUCTURE) being positive (1.03;  $p \leq .017$ ). On the other hand, the relationship between stock market returns and CEO compensation is much weaker in widely-held U.S. firms than widely-held Canadian firms, with the interaction term coefficient (as indicated by RETURN\*STRUCTURE) being significantly negative (-0.85;  $p \leq .007$ ). In addition, the coefficients for return on equity (ROE) remain statistically insignificant when firm structure is used as a moderating variable.

Additional tests were performed to examine how firm size affected the results. Including firm size as an explanatory variable of executive compensation did not affect statistical inferences with respect to the coefficients of firm performance measures, ownership structure and interaction terms (new regression's adjusted  $R^2$  of 58%;  $F = 26$ ,  $p \leq .001$ ). However, as a result, the magnitude of individual performance measure coefficients was reduced. As well, general F tests on hierarchical regressions (Neter et al. 1983:286) indicate that firm size has incremental explanatory power over firm performance and ownership structure in explaining CEO compensation ( $p \leq 0.010$ ). Moreover, separate country-specific regressions were performed with results not being modified. Diagnostic tests (e.g., an examination of variance inflation factors; lack of fit tests) did not indicate the presence of multicollinearity in those regressions (Burn and Ryan 1983).

## ***DISCUSSION***

The purpose of the present study was twofold: first, to obtain empirical evidence on the determinants of executive compensation in Canadian firms, and second, to provide a comparative analysis of the determinants of executive compensation between Canadian and U.S. firms. There are three statistically significant findings for our Canadian sample: 1) there is a significant positive association between firm size and executive compensation; 2) the level of compensation is lower in closely-held than in widely-held firms, and; 3) the strength of the association between stock market returns and CEO compensation for closely-held firms is weaker than for widely-held firms.

In addition, our findings indicate that there are four statistically significant differences between the strength and/or the direction of the determinants of executive compensation between Canada and the U.S.: 1) executive compensation is less responsive to firm size in U.S. firms than in Canadian firms; 2) executive compensation is more responsive to return on equity in U.S. firms than in Canadian firms; 3) the influence of ownership structure on the association between firm performance and executive compensation is greater in U.S. than in Canadian firms; and 4) a significant association between stock market performance and executive compensation is generally found only in widely-held firms in Canada and in closely-held firms in the U.S.. Overall, these results indicate that U.S.-based findings on executive compensation are not generalizable to the Canadian context.

The divergent practices found between the two countries' executive compensation practices may possibly reflect differences in national income tax policy between countries. Scholes and Wolfson (1992) suggest that firms will structure their transactions in order to maximize the level of after-tax income retained by them and their executives. Thus, differences between national tax policies may lead to differences in compensation policies. Unfortunately, this does not appear to be a likely explanation for the differences found between Canada and the U.S. executive compensation practices as the respective national tax policies do not appear to differentiate between the type or amount of cash compensation paid for the period of our sample. In order to understand the basis for this pattern of results, an examination of the joint effect of a firms' country of residence and ownership structure on executive compensation is required.<sup>2</sup>

As illustrated in Table 4, the influence of ownership structure on the association between firm performance and executive compensation differs between the United States and Canada. For the U.S. sample, performance-contingent pay is found for executives of closely-held but not widely-held firms. However, for the Canadian sample, performance-contingent pay is found for executives of widely-held but not closely-held firms. Our results do not display any evidence of an association between firm performance and executive compensation for closely-held Canadian firms or widely held U.S. firms. These results suggest a need to re-examine the agency theory perspective upon which our hypotheses were based.

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2. Starting in 1994, American tax legislation limits the deductibility of non-performance contingent executive compensation to \$1 million. Thus, it is anticipated that the differences in the relationship between firm performance and compensation between countries as found in our study should increase (see *The Wall Street Journal*, April 13, 1994; special supplement on executive compensation).



Agency theory suggests that performance-contingent compensation is a function of the amount of discretion which executives possess. However, different interpretations of agency theory postulate contradictory effects regarding the presence of performance-contingent compensation and executive discretion. The hypotheses regarding the influence of ownership structure on performance-contingency in our study are based upon an interpretation of agency theory which suggests that when given the discretion to do so, executives will pay themselves more and make less of their pay performance-contingent. In other terms: "we assume that CEOs will act in their own best interest, and owners will act in theirs. All else being equal, owner-controlled [closely-held] firms should make a larger share of compensation contingent on performance than will management-controlled firms [widely-held]" (Gomez-Mejia et al. 1987:56).

Our findings for the U.S. sample are consistent with the theoretical perspective and results previously identified by Gomez-Mejia et al. (1987, 1989). In their research, ownership structure is used as a surrogate for the control structure of a firm. According to their perspective, the presence of performance-contingent compensation in closely-held U.S. firms can be interpreted to suggest that environmental complexity precludes the direct monitoring of executives' actions in the U.S.; hence, the board of directors have chosen to impose performance-contingent compensation to align the interests of executives with shareholders. In addition, the lack of a significant association between firm performance and executive compensation for widely-held U.S. firms can be interpreted as evidence that the board of directors do not possess the ability to impose performance-contingent compensation of executives of widely-held U.S. firms.

In contrast, our Canadian findings do not support the theoretical interpretation of agency theory for performance-contingent compensation advanced by Gomez-Mejia et al. Our results identify a significant association between executive compensation and firm performance in widely-held Canadian firms and no significant association between executive compensation and firm performance in closely-held Canadian firms. However, our Canadian findings are consistent with another agency-based interpretation of performance-contingent compensation which posits that performance contingent pay is a mechanism used by boards of directors to control the actions of a firm's executives when they cannot be directly observed (Finkelstein and Hambrick 1988; Rajagopalan and Prescott 1990). This interpretation argues that when boards of directors can otherwise observe and control the actions of executives, there is little need for a performance-contingent pay scheme. Thus, the lack of performance-contingent compensation indicates that there is little need for performance-contingent compensation in closely-held Canadian firms and can be interpreted as evidence that the actions

of executives in these firms can be directly monitored. In addition, this interpretation also implies that the existence of performance-contingent compensation in widely-held Canadian firms is evidence that their respective boards of directors possess sufficient power to impose performance-contingent compensation on executives even without "ownership control".

We suggest that the pattern of our empirical findings of performance-contingent compensation in Canada and the U.S. may be explained by the integration of these two agency based perspectives. Table 5 illustrates this explanation by identifying the pattern of presence (or lack) of performance-contingent compensation by country according to a firm's ownership structure.

TABLE 5  
Integration of Agency Perspectives on Ownership Structure and Performance-Contingent Compensation by Country

	<i>U.S.</i>	<i>CANADA</i>
<b>WIDELY-HELD</b>	Compensation is not contingent on performance (no ability)	Performance-contingent compensation
<b>CLOSELY-HELD</b>	Performance-contingent compensation	Compensation is not contingent on performance (no need)

The integration of these two perspectives suggests that both the *need* and the *ability* to impose performance-contingent compensation on executives must exist before performance-contingent compensation is found in firms. This implies that the existence of both a need and an ability to impose performance-contingent compensation can be found in widely-held U.S. firms and closely-held Canadian firms. In these firms, boards of directors have sufficient power to impose performance-contingent compensation and there is sufficient need to use performance contingent compensation to align the interests of executives with that of shareholders. This would also imply that in widely-held U.S. firms there exists a need but no ability to impose performance-contingent compensation on executives. This is analogous to a high level of executive discretion. Finally, this interpretation would suggest that closely-held Canadian firms are indicative of the circumstance for which there exists the ability but no need to impose performance-contingent compensation. This is analogous to a low level of executive discretion.

Our findings appear to indicate that managerial discretion is a function of ownership structure *and* environmental factors. Differences between national business communities may influence the relative level of discretion that executives of each country possess. Possibly due to the reduced complexity of the Canadian environment and to personal attributes of Canadian board members, Canadian executives may possess relatively less discretion than their American counterparts. This suggests that executives of widely-held and closely-held American firms hold high and moderate levels of discretion, while executives of widely-held and closely-held Canadian firms hold moderate and low levels of discretion, respectively. However, direct measurement of the amount of executive discretion is needed for each type of firm by country in order to substantiate this explanation of our results. This is an area for future research.

### **CONCLUSION**

Overall, the study makes three contributions to our knowledge of executive compensation practices. First, it identifies three determinants of executive compensation in Canadian firms: firm performance, firm size and ownership structure. Second, the results of this study imply that great care is needed when generalizing findings based upon American findings to other countries. Third, it demonstrates that a firm's country of residence (Canada or the United States) and ownership structure jointly influence the association between firm performance and executive compensation. This indicates that previously held interpretations of agency theory as applied to the understanding of executive compensation practices may be incomplete. An expanded interpretation of the implications of managerial discretion (or lack thereof) beyond that previously relied upon may increase our understanding of how ownership structure influences the performance-compensation association.

This study has some limitations which may influence the validity of its results. First, all inferences are based on a restricted sample of Canadian and U.S. firms that is not representative of the entire population of firms in the respective country. However, the sample does contain firms and information that are highly comparable since they are all traded publicly on an American stock exchange and must comply with U.S. disclosure requirements. Second, since the study is exploratory, only a single measure of executive compensation (salary+bonus) is considered. While disclosure requirements that existed for the time period under study did not allow the use of alternative compensation measures, new SEC and Ontario disclosure requirements mandating more extensive and consistent compensation disclosure will provide opportunities for extensions of the present study in

future periods. Finally, the study is cross-sectional in nature. A time-series investigation of annual variations in compensation practices between countries may facilitate data standardization and offer insight into structural influences on executive compensation.

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## **RÉSUMÉ**

### **Une analyse comparative de la rémunération des dirigeants de firmes canadiennes et américaines**

Partout en Amérique du Nord, la rémunération des dirigeants de sociétés ouvertes fait de plus en plus l'objet d'un examen minutieux. Cette préoccupation se reflète dans la presse populaire (*Globe and Mail*, 10 avril 1993 ; *Time*, 9 janvier 1992) et dans les multiples revues de littérature sur la rémunération des dirigeants (Gomez-Mejia et Welbourne 1989 ; Lambert et Larcker 1991 ; Milkovich et Rabin 1991). Toutefois, la quasi-totalité de la recherche a été réalisée dans un contexte américain. En effet, alors qu'aux États-Unis la Securities and Exchange Commission (SEC) exige que les sociétés ouvertes divulguent la rémunération de leurs cinq dirigeants les mieux payés, les réglementations canadiennes n'obligeaient jusqu'à récemment les sociétés ouvertes à ne divulguer que la somme reçue par leurs dirigeants en tant que groupe.

La présente étude vise à combler partiellement ce vide en utilisant les seules données fiables sur la rémunération des dirigeants canadiens, lesquelles sont publiées par des sociétés dont le siège social est au Canada et dont les actions sont négociées sur un marché boursier américain. Ces sociétés sont sujettes à la réglementation américaine de divulgation de la rémunération des dirigeants. La rémunération des dirigeants de ces sociétés

canadiennes est d'abord analysée quant à l'étendue des quatre liens suivants (1) la relation entre la taille de l'organisation et la rémunération des dirigeants, (2) celui entre la performance organisationnelle et la rémunération des dirigeants, (3) l'effet direct du contrôle financier de la firme sur la rémunération des dirigeants et, (4) l'effet modérateur du contrôle financier d'une firme sur la relation entre la performance organisationnelle et la rémunération des dirigeants. Par la suite, la rémunération des dirigeants de ces sociétés canadiennes est comparée à celle des dirigeants de sociétés américaines similaires (taille, secteur) quant à l'étendue des quatre liens susmentionnés. L'ampleur des liens est inférée des coefficients obtenus d'analyses de régressions des moindres carrés.

Les résultats obtenus indiquent que la taille d'une organisation est reliée positivement à la rémunération des dirigeants des sociétés canadiennes, et de façon plus étroite que pour les dirigeants de sociétés américaines. Les résultats sont cohérents avec ceux obtenus par les études antérieures tant britanniques qu'américaines. Les résultats de l'étude indiquent également que la performance organisationnelle, mesurée par le rendement de l'avoir des actionnaires, influence positivement la rémunération des dirigeants de sociétés canadiennes. Cette relation est toutefois plus forte dans le cas des dirigeants de sociétés américaines. Il ressort également de l'étude que la présence d'actionnaires importants dans une société (contrôle restreint) réduit le niveau de rémunération de ses dirigeants comparativement aux sociétés sans bloc de contrôle (propriété dispersée). Cet effet est plus marqué pour les sociétés américaines.

La relation entre la performance organisationnelle et la rémunération des dirigeants de sociétés canadiennes et américaines est toutefois modifiée par l'introduction du contrôle financier comme variable modératrice. En effet, la performance organisationnelle — estimée à partir d'un indice de marché — a un effet positif sur la rémunération des dirigeants de sociétés canadiennes à propriété dispersée mais non sur la rémunération des dirigeants de sociétés canadiennes à contrôle restreint. Par contre, pour les dirigeants de sociétés américaines, la relation entre la performance organisationnelle — estimée par un indice de marché — et la rémunération des dirigeants est positive uniquement pour les sociétés à contrôle restreint mais non pour les sociétés à propriété dispersée. Les résultats obtenus pour les firmes américaines, mais non pour les firmes canadiennes, sont cohérents avec l'interprétation de la théorie des agences proposée par Tosi et Gomez-Mejia (1989). Selon ces auteurs, l'existence d'un bloc de contrôle dans l'actionnariat d'une firme devrait amener l'établissement d'un lien plus étroit entre la performance organisationnelle et la rémunération des dirigeants car les actionnaires ont la capacité d'imposer une formule de rémunération contingente à la performance.

Cependant, l'interprétation des résultats peut être enrichie en considérant le concept de discrétion managériale proposé par Finkelstein et Hambrick (1988). Selon ces derniers auteurs, le lien entre la performance organisationnelle et la rémunération d'un dirigeant est déterminé par (1) la latitude dont il dispose dans la prise de décision, (2) la difficulté pour les administrateurs de régir son travail et, (3) l'influence du dirigeant sur le niveau de performance de la firme. Dans ce contexte, l'absence d'effet de la performance organisationnelle sur la rémunération des dirigeants de firmes canadiennes à contrôle restreint peut s'expliquer par le faible degré de discrétion managériale qu'ils détiennent et par la facilité qu'ont les membres du conseil d'administration d'effectuer un suivi de leurs décisions. Les administrateurs ont donc le pouvoir d'imposer une formule de rémunération contingente à la performance mais n'en voient pas le besoin. D'autre part, le lien entre la performance organisationnelle et la rémunération des dirigeants de firmes canadiennes à propriété dispersée peut résulter d'une plus grande discrétion managériale et de la difficulté pour les membres du conseil d'administration d'apprécier directement les décisions de gestion. Les écarts entre les résultats obtenus pour les firmes canadiennes et américaines nous suggèrent que les différences entre les environnements institutionnel et culturel de chaque pays sont potentiellement importantes et peuvent déterminer la rémunération des dirigeants. Des recherches futures pourront approfondir cette question.